

AMENDMENTS TO THE CLAIMS

This listing of claims replaces all prior versions, and listings, of claims in the application.

Claims 1-10 (Cancelled).

11. (Currently Amended) ~~The A~~ A communication system ~~according to claim 1,~~ including:

a plurality of mobile stations; and

a base station system communicating with the mobile stations and providing the mobile stations with a plurality of application services, without a network layer protocol, through communication based on an Extended Link Control Protocol (ELCP), as one application of a Dedicated Short-Range Communication (DSRC) protocol, between the mobile stations, which travel on a road, and the base station system, which is located along the road, wherein each of the mobile stations and the base station system comprises

a transfer service processing entity implementing data transfer among the plurality of applications, wherein the transfer service processing entity identifies an application, with one of the mobile stations and the base station system as a sending source, from among the plurality of applications, utilizing port numbers; and

a transaction management entity providing unidirectional data transmission and request-response transactions, wherein the transaction management entity identifies a unit of a transaction between a mobile station and the base station system utilizing a transaction ID uniquely identifying a corresponding port number and an identifier designated by and identifying a respective application, of the plurality of applications, wherein

the transaction management entity includes

undelivered data segment resending means for resending undelivered data segments of a message,

data sending and receiving means for sending and receiving each message of a plurality of messages, and

message segmenting and assembling means for segmenting a message generated by an application into a plurality of data segments and assembling a plurality of data segments of a message into the message,

the transaction management entity of a sending station, of the mobile station and the base station system, when an identifier designated by an application is unchanged, uses the same transaction ID, divides a message into a plurality of data segments and adds to each of the data segments the transaction ID corresponding to the respective port number and one of sequential numbers for transaction identification and sends the message as the plurality of data segments with the transaction ID and sequential numbers, and

the transaction management entity of a receiving station, of the mobile stations and the base station system, reassembles the message sent by combining the data segments having identical transaction IDs, in an order based on the sequential numbers, and processes a newly received data segment identically to the data segment that has been previously received when the transaction ID of the newly received data segment is identical to the transaction ID of the data segment that was previously received.

Claim 12 (Cancelled).

13. (Previously Presented) The communication system according to claim 11, wherein, when the transaction management entity of a receiving station, of the mobile stations and the base station system, receives a final data segment of the message, the transaction management entity of the receiving station notifies the transaction management entity of the sending station of the sequential numbers of any

undelivered data segments, and the undelivered data resending means of the transaction management entity of the sending station resends only the undelivered data segments.

Claims 14 and 15 (Cancelled).

16. (Previously Presented) The communication system according to claim 11, wherein the transaction management entity uses a bulk area prepared by an application indicating a buffer region for assembling data segments into a message, and a bulk size indicating size of the buffer region designated by an application, of the plurality of applications.

Claims 17 and 18 (Cancelled).

19. (Currently Amended) ~~The A~~ communication system ~~according to claim 1,~~ including:

a plurality of mobile stations;

a base station system communicating with the mobile stations and providing the mobile stations with a plurality of application services, without a network layer protocol, through communication based on an Extended Link Control Protocol (ELCP), as one application of a Dedicated Short-Range Communication (DSRC) protocol, between the mobile stations, which travel on a road, and the base station system, which is located along the road, wherein each of the mobile stations and the base station system comprises

a transfer service processing entity implementing data transfer among the plurality of applications, wherein the transfer service processing entity identifies an application, with one of the mobile stations and the base station system as a sending source, from among the plurality of applications, utilizing port numbers; and

a transaction management entity providing unidirectional data transmission and request-response transactions, wherein the transaction management entity identifies a unit of a transaction between a mobile station and the base station system utilizing a transaction ID uniquely identifying a corresponding port number and an identifier designated by and identifying a respective application, of the plurality of applications, wherein the transaction management entity includes undelivered data segment resending means for resending undelivered data segments of a message,

data sending and receiving means for sending and receiving each message of a plurality of messages, and

message segmenting and assembling means for segmenting a message generated by an application into a plurality of data segments and assembling a plurality of data segments of a message into the message;

a transfer service processing entity, wherein the transfer service processing entity sends a list of accessible ports registered by applications of the transfer service processing entity to a peer station, of the mobile stations and the base station system, when a DSRC connection is established; and

a transaction management entity providing unidirectional data transmission and request-response transactions, wherein the transaction management entity of the sending station sends, upon receipt of the list of accessible ports, transaction start enable information to an application which has requested starting of a transaction with a port that is included in the list of accessible ports, so that the application starts the transaction.

Claims 20 - 23 (Cancelled).

24. (Previously Presented) The method of claim 27, further including:
receiving an open port request from a first application running on the first station, wherein the open port request includes the source port number identifying the first application; and
updating a port list of the first station to include the source port number.

25. (Previously Presented) The method of claim 24, further including:
sending a packet including one of the segments from the first station to the second station;
starting a timer at the first station;
determining whether an acknowledgement corresponding to the packet is not received by the first station before the expiration of the timer; and
retransmitting the packet from the first station to the second station if the acknowledgement corresponding to the packet is not received by the first station before the expiration of the timer.

Claim 26 (Cancelled).

27. (Previously Presented) A method of communicating between a roadside unit and an on-board mobile unit in a vehicle through a Dedicated Short-Range Communication (DSRC) protocol, the method including:

receiving a data transmission request from one of a plurality of applications supported by a Local Port Control Protocol (LPCP) layer on a first station for transferring application data to a peer application on a second station, wherein
each application is identified by a unique port number and the application data are associated with a transaction identifier identifying a transaction between the application and the peer application, and
the data transmission request includes a source port number identifying the application and a destination port number identifying the peer application;

converting the application data into data segments in response to the data transmission request, wherein each data segment is identified by a sequence number;

encapsulating into a protocol data unit each of the data segments, the transaction identifier associated with the application data, the sequence number associated with the data segment, the source port number, the destination port number, and an access point identifier, which identifies the LPCP layer;

issuing a send unit data request to an (ELCP) Extended Link Control Protocol layer identified by an application identifier for sending the protocol data unit to the second station; and

encapsulating, in response to the send unit data request, the application identifier with the protocol data unit and passing the protocol data unit that has been encapsulated to a DSRC protocol layer at the first station for transmitting the protocol data unit to the second station in accordance with the DSRC protocol.